

REMARKS

Rejection under 35 USC§ 112

The Examiner has rejected Claim 1 under 35 USC 112 first paragraph as not being enabling for aluminium concentrations between 1.5×10^{-2} mol/l. Applicants have inserted Claim 5 into Claim 1 to provide this lower limit to overcome this objection.

The Examiner has also objected under 35 USC 112 second paragraph that the term 'ambient' in Claim 1 is a relative term which renders the claim indefinite. Although Applicants submit that it is well known to the skilled man that 'ambient' temperature means 'room temperature' and indicates an absence of heating, the definition from page 4 line 7 has been inserted into Claim 1 to overcome this objection.

Rejection under 35 USC§ 102

Claims 1-12 and 17 are rejected under 35USC 102(b) as anticipated by Poncelet (US 6,468,492). '492 teaches a method of preparing an aluminosilicate polymer of the imogolite type having a filamentous tubular crystallized structure. In order to prepare such a specific structure it is required that the method includes a solubilization, ripening and thermal treatment step.

Thus the first step is, as in the present invention, a step of contacting a mixed aluminium-silicon alkoxide or a precursor thereof with an aqueous alkali keeping certain concentrations within set limits. As shown in the Example, this will normally be followed by a solubilization step, for example with an acid such as acetic acid, to decrease the pH and solubilise the precipitate. Then a ripening step at room temperature is required which according to col. 2 line 47 takes at least 5 days and enables the time for the subsequent thermal step to be considerably reduced. The mixture then has to be *heated* at a temperature 'below 100°C' and according to col. 2 lines 63-64 at 96-98°C for 24 hours, which results in the 'formation in solution of an aluminosilicate polymer of the imogolite type' (see col. 3 lines 1 and 2). Finally as with the present invention residual ions from the polymer are removed.

It will be appreciated that this is distinct from the process of the present invention, particularly as presented in amended Claim 1. In addition to

giving the metes and bounds of 'ambient temperature' and including the lower limit for the aluminium concentration from original Claim 5, Claim 1 now includes the subject matter of Claim 9 as an optional step including the further dispersion with acid associated therewith, with support from page 6, lines 1-10. Claim 1 then requires that the step of eliminating the byproducts follow *directly* thereafter, as described in the embodiments discussed at pages 5-6, such that there is no intermediate heating step, as required by '492. Therefore it is respectfully submitted that the objection under 35USC 102 be withdrawn since Claim 1 lacks an essential feature of '492 and therefore is novel thereover. Nor is there any hint, teaching or suggestion that would lead the skilled man to expect that he could omit the heating step.

Rejection under 35 USC§ 103

Claims 13-16 stand rejected under 35USC 103(a) as being unpatentable over '492 in view of Pinnavia *et al* (US 7,132,165).

The Examiner states that '492 further teaches the introduction of a 'chelating agent' to the precipitate, in that a 50:50 mixture by volume of HCl and CH₃CO₂H is used, whilst acknowledging that the order of addition of the chelating agent is different from in the present invention. Thus it will be noted that this addition in '492 occurs immediately after step (a), its purpose being only to redisperse i.e. solubilize the precipitate by lowering the pH which is necessary before the ripening step.

In contrast, the chelating agent, if used, is for quite a different purpose in the present invention, being an optional *final* step, i.e after eliminating the byproducts. The purpose of the chelating agent here is to allow the modification of the surface of the aluminosilicate polymer by forming a chelate *compound*, the functional group of the chelating agent allowing an increase in affinity of the aluminosilicate polymer with the medium in which it is used (as explained on page 7, lines 11-14).

The Examiner refers to '165 as teaching that surfaces may be functionalized by reaction with various chlorides, fluorides, silylating or alkylating agents. In contrast it will be seen that the chelating agents used in the present invention are acids such as carboxylic acids, phosphonic acids, esters, amino acids etc. There is no hint, teaching or suggestion in '165 that such a

'chelating agent' were to be used, nor that it could be used in association with the multistep process of the present invention.

The Examiner has stated that the instant case does not provide evidence as to why the order of chelate addition would result in a materially different result. However as explained above, the chelating agents are used at entirely different steps in the overall process for different purposes and as will be shown hereunder in the preparation of materially different products.

Product Claims 18 and 19 stand rejected under 35USC 103(a) as being unpatentable over '492. The Examiner considers that it would have been obvious to utilize the method of the invention taught in '492 to produce the polymer and that the Raman spectrum figures are inherent characteristics of the material obtainable by the method.

However Applicants submit that the material obtainable by the method in accordance with the method of '492 is quite different as can be seen by a comparison of the Raman spectra. Thus Comparative Example is as described in EP-A-1 112 959 which is the equivalent of '492. It is said at the end of this Example that materials that have the same Raman signature belong to the same family.

The Raman spectrum of this material is represented by Figure 1 and the relevant footprint for comparison is at the low wavenumber, the peak at the higher wave number end corresponding with the presence of the carboxylate ion from the addition of the acetic acid in step (a). It will be seen that there is a main peak at about 500 cm^{-1} with a peak close on either side. In order to make as close a comparison as possible, this should be compared with Figure 7 as this pertains to Example 9 which included the addition of acetic acid, albeit as a chelating agent in step e). Again there are peaks corresponding to the acid at the high wavenumber but it will be clearly seen that the Raman spectrum is quite different as befitting a very different structural material. Here the main peak is at 1000 cm^{-1} but there is no discernible peak at 500 cm^{-1} . Thus it is respectfully submitted that the materials produced according to the process of '492 on the one hand and the present invention on the other hand are quite different, that of '492 being in a fibrous, tubular form and that of the present invention being in fact of spherical form.

Double patenting

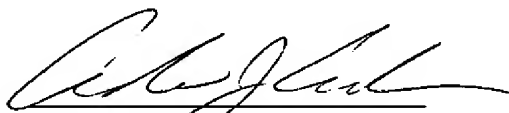
Claims 1-19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting (ODP) over claims 1-11 and 17-24 of copending application no. 10/521899 in view of Pinnavia. The examiner states that the conflicting claims are considered to be identical to the instant claims except for the addition of non-hydrolyzable functional groups of silicon compounds as taught by Pinnavia, and that it would have been obvious to one of ordinary skill in the art to make such a modification as set forth in the 103 rejection. This rejection is respectfully traversed, as the claims of the instant application and those of copending application no. 10/521899 are directed towards mutually exclusive inventions. In particular, the invention of present claim 1 requires “treating a mixed aluminum and silicon alkoxide only comprising hydrolyzable functions, or a mixed aluminum and silicon precursor resulting from the hydrolysis of a mixture of aluminum compounds and silicon compounds only comprising hydrolyzable functions” (underlining added), while the invention of copending application no. 10/521899 claim 1 requires “treating a mixed aluminum and silicon alkoxide of which the silicon has both hydrolyzable substituents and a non-hydrolyzable substituent, or a mixed aluminum and silicon precursor resulting from the hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent” (underlining added). As such claimed inventions are directed towards mutually exclusive inventions, neither claimed invention anticipates the other. Further, the Examiner has not in any way established a prima facie case of obviousness of the present claims over those of copending application no. 10/521899 in view of Pinnavia, as no explanation has been set forth as to why it would be obvious to modify the invention of copending application no. 10/521899 in view of Pinnavia in a way that would necessarily result in the present claimed invention. Reconsideration of this rejection is accordingly respectfully requested.

Claims 18-19 are provisionally rejected on the grounds of nonstatutory double patenting over claim 1 of copending application no. 10/522006. The instant application and copending application no. 10/522006

were filed on the same day. In accordance with MPEP 804 I.B.1, it is respectfully urged that to the extent this provisional nonstatutory double patenting rejection may be the only rejection remaining in this application, and the copending application has not been allowed, the invention of the instant application may be regarded as the "base" invention, and such provisional rejection should be withdrawn in this application and this application allowed to issue. A terminal disclaimer may be filed, if required, in the copending application prior to issuance thereof.

In view of the foregoing amendments and remarks, reconsideration of this patent application is respectfully requested. A prompt and favorable action by the Examiner is earnestly solicited. Should the Examiner believe any remaining issues may be resolved via a telephone interview, the Examiner is encouraged to contact Applicants' representative at the number below to discuss such issues.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.